

DYNAMICS OF
INDIAN AGRICULTURE
SINCE INDEPENDENCE
PENETRATING GLIMPSES

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PENETRATING GLIMPSES**



by

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PREFACE

Rapid economic development of under-developed regions need the background of a dynamic agriculture. Agriculture has a double role to play under such situations. Firstly, it is this sector which has to provide the man-power which would be needed in the process of development. Secondly, as more and more people will be employed in the non-agricultural sectors, their food requirements will have to be met through a surplus made available from the agricultural sector. Thus a developing economy has to be backed by an agriculture which is capable of saving and mobilising human as well as food resources for employment and use in the other sectors.

Indian agriculture showed an unprecedented fillip during the one decade and more after the attainment of political independence. This when it comes after a stage of stagnation—if not decaying—for a known period of nearly fifty years substantiates the need for an enquiry into the factors that helped this sudden spurt.

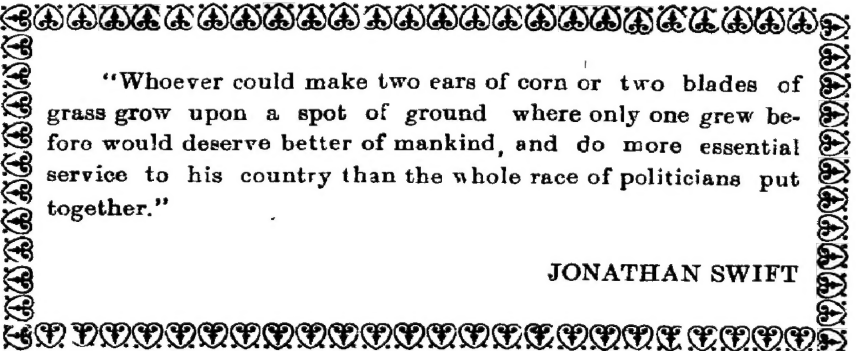
There would be criticism from many quarters that Indian agriculture failed to meet the increasing demands placed on it. But it would be fair to say that the demands placed on it were much more than what could have been expected from it under the conditions existing. In the pages to follow are given a survey of the conditions that prevailed in the agricultural sector at the beginning of the era of planned economic development and the factors that helped the rapid development in agriculture. The rapid increase in the rate of population growth and the significantly large volumes of outlay were mainly responsible for reducing in substance large achievements that were made on the agricultural front. While examining the magnitude of these forces, this pamphlet will also suggest measures which policy ought to take into account. Much of the relevant discussion on Indian Agricultural Economics, particularly during the recent years, is widely diffused and beyond the approach of the post-graduate students who have very little time to devote in order to scan the pages of the plethora of papers

published in various journals and reports. The author has tried to bring together these for the benefit of students mainly with a view to saving their time and energy without missing any of the important aspects.

P. V. JOHN

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"Whoever could make two ears of corn or two blades of grass grow upon a spot of ground where only one grew before would deserve better of mankind, and do more essential service to his country than the whole race of politicians put together."

JONATHAN SWIFT

CHAPTER I

THE STAGNANT BACKGROUND

Available studies indicate that Indian Agriculture was in a stage of stagnation for a considerably long period of time before the initiation of the First Five-Year Plan. In this context one may refer to the studies by S. Siva Subramaniam and P.K. Mukherjee in a paper which they submitted to the Tenth International Conference of Agricultural Economists under the title "Agricultural Output and National Income"¹. This study has revealed that during the period 1900 to 1945 agricultural output in India has increased only by 12.6%. This was in spite of an increase of 18.4% in the area under cultivation. As a matter of fact, since production had increased by only 12.6% when acreage itself had increased by 18.4% the yield per acre of the major crops had either declined or remained more or less stationary.

The reasons for this stagnation will have to be sought among the key variables such as land, labour, capital, technique and organisation on which depends the agricultural output.

Land in the structure of Indian agriculture :

India, no doubt, is a vast country and has a surface area of 806 million acres. But we have also a large number of people to support. According to the census of India, 1951 the population of the country was 356.75 million. The *per capita* land area available was, therefore, only a little over 2 acres. This compares very adversely with the *per capita* land area in some of the economically advanced regions/countries as could be seen from Table I.

TABLE I

Countries	Total Land area (cr. of acres)	Population (crores)	Area <i>per capita</i> (in cents)	
			All land	Agricultural land
1. U.S.A.	191	15	1,264	741
2. Europe (excluding USSR)	122	40	307	153
3. U.S.S.R.	590	19	3,046	448
4. India	81	36	225	97

1. Studies in Indian Agricultural Economics : Edited by Bhattacharjee, J. P., published by Indian Society of Agri. Economics, Bombay 1958.

Even of the available area, hardly one-third was under cultivation at the beginning of the period of planned economic development in India.

Extension of the frontier

The area under cultivation can be increased in two ways. Firstly, it can be increased by cultivating more and more lands, and secondly, by increasing the frequency of cultivation on the area already under cultivation. Indian sub-continent being one of the oldest to be settled and the pressure of population being so heavy, there was very little scope for adding to the area under cultivation by 'expansion of the frontier' as was done in the United States or Australia. The area that remained uncultivated provided limited scope for such expansion could easily be realised from the classification of land given in Table II as it existed in 1947-48.

TABLE II

	Area (in Millions of acres)	Percentage of reported area
1. Reported area	589.82	100.0
2. Forests	88.58	15.4
3. Area not available for cultivation	101.34	17.2
4. Other uncultivated land excluding fallows	92.44	15.7
5. Fallow land	60.92	10.2
6. Net sown area	245.51	41.5
7. Area sown more than once	32.65	5.5
8. Gross sown area	278.10	47

Statistical classification was available for only 589.8 million acres in 1947-48. This was 73.2% of the total land surface. Nearly 15.4% of the classified area was forests, and another 17.2% area not available for cultivation. The latter class included areas which are either put to non-agricultural use or are barren and uncultivable wastes. Thirdly, about 15.7% was shown as other uncultivated land excluding current fallows. This class included (a) permanent pastures and grazing land, (b) miscellaneous trees, crops and trees not included in the area sown and (c) cultivable wastes. Fourthly, 10.2% was fallow lands including both current and other fallows.

Extension of cultivation, if it were to be resorted to, could only be done at the expense of (a) forests, (b) other non-cultivated land, *i.e.* pastures, meadows etc. or (c) fallow lands.

Obviously this could not be done indiscriminately because these three types of land had a definite role in the land utilisation pattern of the country in that they are necessary for economic stability and development.

To take them one by one, forest is a very essential thing in that besides providing wood and other things which are economically useful, it also checks erosion. We have many rivers in the country the course of which is through steep terrains. In this course they usually carry away soil and cause erosion. It is the forests which help to check such erosion. In certain regions, forests help also rainfall. During the past years there has been such an indiscriminate felling of trees and habitation in forest areas that instead of forests providing any scope for further cultivation what is needed is a programme of afforestation.

It is pastures and meadows which provide food for our cattle. The cattle wealth of India was estimated at 136.7 million in the year 1945. This excludes other forms of livestock like buffaloes, sheep, horses etc. There is something very pathetic about our cattle. They, inspite of our love and adoration for them, are paradoxically enough famished and in many cases useless. In many parts of the country there is no provision for pastures and meadows. If we are to maintain our cattle wealth, which is the backbone of peasant cultivation, it is essential that there should be a stepping up of area under pastures and meadows.

Due to constant use land loses its fertility. In order to revitalise it, it used to be the practice—and is still with many farmers—to leave a portion of the land as fallow. Such lands are called current fallows. Besides, due to changes in climatic conditions or due to erosion etc., or litigation process, land goes out of cultivation. It is this class of land which is the potential source for expansion.

There is also the other class, the uncultivable waste which could help expansion provided these lands could be made cultivable in the first instance through expansion of irrigation facilities etc.

At the macro level, thus there was not only a genuine shortage of cultivated area, but there was also restricted scope for expanding cultivation. Alternatively, as suggested earlier, on the area already

under cultivation, the frequency of cultivation could be increased thus expanding the scope for cultivation. At the beginning of the period of our analysis of a total area of 245·5 million acres of cultivated land, 32·6 million acres were sown more than once thus boosting the gross sown area to 278·1 million acres. On 212·9 million acres cultivation was restricted to only once. This was in spite of the fact that usually crops took about three to four months only from the time of their sowing to their harvests. In many cases, this period was even less. The main factor that is responsible for cultivation apart from land and other resources is the availability of water.

On an average we get 42 inches of rainfall in India. Variations from this normal, of course, take place. For instance, in 1917 it was as high as 59 inches, while in 1899 it was as low as 34 inches. Apart from this, and more relevant to our discussion, there is considerable variation between different regions in the amount of rainfall received. In this respect India could be divided into five rainfall belts : (1) Yellow belt (receiving below 15 inches), (2) Brown belt (receiving between 15 and 30 inches), (3) Light Green belt (receiving between 30 and 50 inches), (4) Dark Green belt (receiving between 50 and 75 inches), and (5) Blue belt (exceeding 75 inches). Of the five belts, the first two, namely the yellow belt and the brown belt together occupy about one-third of the area, the third one—light green belt—occupies another one-third and the rest one-third of the area accounts for the dark green belt and the blue belt. These belts are spread out geographically over the entire country. Generally 40 inches of rain is sufficient for growing most of the crops. Except for about one-third of the area the rest of the area is not by itself suitable for proper cultivation. Thus cultivation on about two-thirds of the land surface is carried on with scanty rainfall except where there is provision for irrigation facilities.

Of the 245·5 million acres of net sown area 46·6 million acres were under irrigation in 1947-48. It could safely be assumed that the irrigated land was spread over equally in the different rainfall belts though there is a natural tendency for irrigation to be concentrated in areas with a heavy rainfall. Even when we make such an assumption it can be seen that large tracts of land get scanty rainfall (nearly two-thirds of the land surface) and on these even

one cultivation is hardly possible. Thus extension of cultivation is very much a function of availability of water and, therefore, of extension of irrigation facilities. Extension of irrigation in turn, depends upon capital investment into which we would look later.

There was thus very little scope for extending the cultivation at the beginning of the period. In the absence of ample irrigation facilities all that was open was to bring under cultivation the area held fallow.

Land rights and pattern of holdings

In under-developed agricultural countries with a lack of alternative investment opportunities, land constitutes perhaps the most important form of asset and the most important source of income. Since its demand generally exceeds its supply and since the possession of land puts a holder in a favoured position, it is only natural that certain prestige value attaches to the possession of land in these countries. With the growth of population, the disparity in the distribution of land tends to become wider and wider and this leaves a larger portion of the population with either holdings which are too small or with no land at all. Moreover, such wide disparity in the distribution of land also adversely affects the economy of agriculture particularly in old countries, because wide disparity may mean cultivation of holdings which are either too large or too small for an efficient combination of other inputs such as family labour, bullock-power, entrepreneurial ability, farm machinery etc. Holdings which are too large could also be uneconomic due to certain diseconomies of scale or due to the failure of other inputs to keep pace with the size of land, while in holdings which are too small, the benefit of economies of scale would be totally absent, and land would become too tiny and too much of a bottleneck on the use of other inputs. Further, existence of very large ownership holdings may encourage leasing out, which would in turn raise many important problems such as landlord-tenant relationship, exploitation of the latter by the former, high rents, waste of agricultural surplus and a diversion of resources from agriculture.

All these evils in one form or other were present—and continue to exist, though in a milder form—at the attainment of independence. In order to understand the extent of these evils, one has to have an idea of the size distribution of holdings—ownership as well

as cultivation holdings—and the manner in which these holdings are held (fragmentation of holdings).

Sufficient data on these aspects are not available for the year 1947-48 or nearby. The Agricultural Labour Enquiry conducted by the Ministry of Labour in 1951 gives the size distribution of cultivation holdings and the National Sample Survey in its eighth round has collected data on ownership holdings and has brought these out for the benefit of those interested, through their Report No. 10. The eighth round study was conducted during the year July, 1953 to June, 1954. Changes in pattern of ownership holdings when not effected through legislation are a slow process and seldom effected. There has been no concerted effort for changing the pattern of holdings between the period 1947-48 and 1953-54 and therefore, the data made available through these studies could be utilised in understanding the background from which our economy started showing signs of progress. In Tables III and IV are presented respectively the distribution of ownership holdings and that of cultivation holdings :—

TABLE III
Distribution of Ownership-Holdings according to
Different Size-Groups (All India)

Size Groups (Acres)	Households		Area		Average size per holding
	Number (000)	Percentage of total	Actual (000 acres)	Percentage of total	
0.001	14,444	22.0	...	...	...
0.01 to 0.99	16,346	24.9	4,275	1.4	0.26
1.00 to 2.49	9,108	13.9	15,277	4.9	1.68
2.50 to 4.99	8,975	13.7	32,404	10.5	3.61
5.00 to 9.99	8,453	12.9	59,550	19.2	7.04
10.00 to 24.99	6,045	9.2	92,132	29.7	15.24
25.00 to 49.99	1,735	2.6	59,881	18.7	33.36
50.00 and above	553	0.8	48,331	15.6	87.40
Total	65,659	100.0	309 850	100.0	4.72

TABLE IV
Distribution of Cultivation Holdings according to
different size-groups

Size of Holdings (Acres)	Households		Area	
	Number (000)*	Percentage	Actual (000 acres)	Percentage
Upto 1.00	5,964	16.8	2,662	1.0
1.1 to 2.5	7,561	21.3	12,247	4.6
2.6 to 5.0	7,450	21.0	26,359	9.9
5.1 to 10.0	6,779	19.1	46,860	17.6
10.1 to 25.0	5,750	16.2	86,531	32.5
25.1 to 50.0	1,490	4.2	50,588	19.0
Above 50	497	1.4	41,003	15.4
Total	35,500	100 0	266,250	100.0

*Estimated from the aggregate number of
households given in the report

From Table III it can be seen that nearly 22% of the households in the rural area do not hold any land. These households may be largely of agricultural labourers who do not own any land and partially of cultivating tenants. The next 24.9% of the households together hold only 1.4% of the land and each of these holds an area less than 1 acre in size. Thus nearly 47% of the households either hold no land or hold land of area less than 1 acre. At the other extreme less than 1% of the households own among themselves nearly 16% of the area and each of these holdings is of a size of 50 acres and above. This distribution of holdings shows the gross inequality of possession of land that prevailed in our rural areas.

Added to this was the existence of several intermediary rights in the ladder ranging from cultivation to ownership.

Land tenure

Indian land tenure is a tripartite relation between government, owner and tiller of the land. There are broadly three types of land

tenure in India, Ryotwari, Zamindari and Mahalwari. Under the Ryotwari system, which prevailed mainly in Bombay and some other parts of the country, there are theoretically only two interests namely the government and the owner-cultivator. The owner-cultivator was only bound to pay the land revenue to the government. There was no rent involved in this system. Under Zamindari system there were three interests on land namely that of the government, zamindar and tenant. The zamindar was responsible for collecting the land revenue and passing it on to the government. He did not do anything other than collection and payment of revenue and he always let out land to the highest bidder leaving the tenants with no security of tenure. He enjoyed the fruits of the tenants' labour and often indulged in luxury without providing either risk, credit or manual labour in the process of agricultural production. The Mahalwari system had the entire village community as the owners with the government above them. The community as a corporate body was responsible for payment of land revenue.

These different systems on the surface do not appear to be very defective but one has to go into their working in order to find out how far they were adversely affecting the agricultural structure.

Lord Cornwallis was responsible for the introduction of the Permanent Revenue Settlement in 1793. Under this the land was auctioned out to zamindars for the promise of a fixed sum of money as revenue to the government. This was at the end of 18th century. But from the beginning of the 19th century the value of land increased considerably. But the government did not share in this increase in the value of land and therefore could not devote part of the increased income accruing from land for the development of land. Apart from this, several intermediaries like Malguzars etc., came up in between the cultivator and the zamindar. The zamindar was the lord who was very remotely connected with the tiller of the soil. The tiller of the soil was deprived of any increase in the value of the produce and hence he was not interested in development of the land. His condition deteriorated and because of a total absence of incentive in the form of better income, he practically neglected the land.

The Ryotwari was a later adoption by the government. This system deteriorated in the 19th century with the coming up of a class of people who desired to own land but not to cultivate it. The debt of peasants prompted sale of land and this favoured transactions to a class of people who were mere absentee landlords. Once the land was transferred to such absentee landlords, the situation was not much different from that of land under zamindars. Under the Mahalwari system also sub-tenants grew up in the course of time establishing a wider gulf between the cultivator and the government. The landlords who were mere absentee owners under the various systems were usually unsympathetic masters with no original love for the land. The real tillers of the soil suffered from various handicaps ranging from insecurity of tenure to non-availability of funds and exploitation by the landlord. Under such tenurial system one could hardly expect anything but stagnation, if not deterioration, in Indian agriculture.

The economies of scale are more directly related to the size of cultivation holdings rather than to that of ownership holdings. Table IV does not give the entire picture, for it excludes households engaged in agriculture but not possessing any land. It was found by the Agricultural Labour Enquiry that nearly 19% of the rural households engaged in agriculture do not possess any land and are mere agricultural labourers. Of those households holding land, it is evident from Table IV that nearly 16.8% cultivate areas less than 1 acre in size and they together hold only about 1% of the total cultivated area. To take a larger size, about 59% of the cultivation holdings are of a size less than 5 acres, and they together hold only 15.5% of the cultivated area. At the other extreme, over 34% of the cultivated area is held by about 5.6% of the farm families, each holding 25 acres and above. The rest of the area is held by farms between the size of 5 and 25 acres. Evidently, then, there is a wide disparity in the size distribution of cultivation holdings. This distribution not only leaves a great deal to be desired but may also explain a good deal of the limitations from which Indian agriculture suffers.

From the economic point of view, inequality in the size of holdings need not in itself be a serious draw-back. But the seriousness of the situation lies in the fact that a large number of holdings

may be far below or far above the optimum size of cultivation unit and hence lead to low productivity or to high cost agriculture.

Fragmentation of Holdings

A more serious phenomenon is the fragmentation of holdings. This phenomenon has been known for many decades to be widespread in all parts of the country and at the beginning of the period we have taken for discussion, a very large proportion of cultivation holdings are held in small plots scattered over different places. In the absence of countrywide data on this topic, in Tables V and VI are given number of fragments per farm and per acre in West Bengal and Uttar Pradesh as was found to be existing by the Farm Management Studies conducted in these States by the Ministry of Food and Agriculture in the year 1954-55.

TABLE V
Fragments per Holding and Per Acre
(West Bengal)

Size-Group (Acres)	No. of fragments per farm	No. of fragments per acre
0.01— 1.25	3.6	5.3
1.26— 2.50	7.1	5.3
2.51— 3.75	9.4	3.0
3.76— 5.00	12.1	2.8
5.01— 7.50	14.3	2.4
7.51—10.00	22.3	2.6
10.01—15.00	17.3	1.4
Above 15.00	35.7	1.4

TABLE VI
Fragments Per Holding and Per Acre In U.P.

Size-Group (acres)	No. of Fragments per holding	No. of Fragments per farm
Less than 2.5	3.60	2.02
2.5 to 5.0	6.26	1.67
5.0 to 7.5	8.94	1.44
7.5 to 10.0	11.90	1.36
10.0 to 15.0	11.76	1.02
15.0 to 20.0	16.10	0.97
20.0 to 25.0	22.89	1.02
25.0 and above	24.85	0.60
All holdings :	10.77	1.12

Some idea about fragmentation of holdings in other States is available from the Government of India publication entitled "Agricultural Legislation in India" Vol II. The paragraph below seems indicative of the extent :—

"It was reported in a Punjab village that the lands were divided into 1,898 fields averaging 1/5th of an acre and 2,890 holdings had each over three fields. In another village 12,800 acres were found to be scattered in 63,000 fields. The average size of some fields in Bihar was found to vary between 0.28 and 0.81 acres, at the time of the last settlement. It was also reported that in Chattisgarh Division of Madhya Pradesh, it was common to find an average holding of 10 and 12 acres scattered all over the village in no less than 30 to 40 small plots of land. In Bombay and Assam there were on an average 3.3 and 4.5 plots to every holding. In Ajmer the number of plots per holding varies from 3.3 to 3.5."

The evils of fragmentation require no emphasis. Waste of time, of man-power, animal power and other resources such as in fencing each separate plot, well-sinking etc. and hence the impossibility of rational low-cost cultivation are obvious effects. In India it has traditionally evoked many a litigation because in operating any particular fragment the farmer and his animals may have to pass through

the farm of his neighbour. This may provoke a dispute often leading to litigation. The larger the number of fragments, the larger is likely to be the boundary strip of a farm adjacent to the boundaries of other farms.

Fragmentation of holding is a feature of countries at all levels of economic development. It may be seen even in countries as highly developed as Switzerland, France and Southern Germany. But in India, from what we know, the magnitude of fragmentation is so large that it can hardly be ignored if a genuine improvement in agriculture is desired.

Thus from the point of view of the size of the operational unit the picture that we have of the structure of land in the Indian economy is one of most discouraging. Strewn into tiny fragments, often too tiny and in many cases held under oppressive tenures, the pattern of land holdings in India was alarmingly derogatory to the productivity and efficiency of the agricultural economy.

Labour

According to the 1951 Census, the population of India was 356.75 million. Of this about 76.9 per cent was found to be dependent on agriculture for their living. That this is quite a high percentage can be seen from Table VII in which the percentage of population dependent on agriculture in India *vis-a-vis* some of the advanced countries is given.

TABLE VII

Countries	Percent of Population Dependent on Agriculture
1. India	69.8
2. U.S.A.	12.8
3. U.K.	5.0

Unemployment and Under-employment

We had earlier seen that the *per capita* availability of cultivated land is very small compared to other countries. Adding to that is this large dependence on land. As a result, a large number of the persons dependent on agriculture are either unemployed or under-

employed. Shri B. N. Datar has given the following estimates of unemployment and under-employment in the Indian agricultural and non-agricultural sectors:-

TABLE VIII

(1) Absolute unemployment (largely urban)	30 lakhs for 12 months
(2) Under-employment :	
(i) Rural agricultural	303 lakhs for 7 months
(ii) Rural non-agricultural	48 lakhs for 6 months
(iii) Urban agricultural	8 lakhs for 7 months
(iv) Urban non-agricultural	21 lakhs for 6 months

The unemployment and under-employment situation is aggravated because of the seasonal nature of agriculture. As was mentioned earlier large tracts of area in India are cultivated with the help of scanty rainfall. Cultivation on these tracts is, therefore, seasonal and the peasants find work only during this period and *per se* will have to remain idle during the rest of the year. This is a type of under-employment and is also called seasonal unemployment. In between sowing and harvesting times also the peasants do not find much to be done. During this period they are under-employed. Another contributory factor for the large volume of under-employment is the small size of holding on which cultivation is carried on in India.

Disguised unemployment

Another evil that has crept in because of the large pressure of population on land is disguised unemployment of a very high magnitude. This type of unemployment is peculiar to under-developed economies and is the result of shortage of complementary resources namely land and capital associated with labour. In the Indian peasant families, what happens is that usually as a junior member attains working age, he or she joins the parents in the field which is limited in area. This is not because there is any more work to be done on the field but because of association. The contribution of the work to production—marginal return—due to addition of the worker is usually nil, and occasionally negative for with the addition of more workers, they may come into each other's way and reduce the aggregate out-

put. The workers themselves are not aware of this type of unemployment, and it is usually exhibited in low productivity. Sri G. Parthasarathy has estimated that the disguised unemployment in Indian agriculture may be of the order of 11.2 to 13.3 millions.

Thus there was widespread unemployment in Indian agriculture which resulted not only in under-utilization of labour but also in lower productivity in many cases. The present author in a recent article on Rural India estimated that the total number of unemployed in the agricultural sector would be about 17 million of a total working force of 57 million. This means that near about one-third of the working force *i.e.*, about 30 per cent is unemployed in one way or other in Indian agriculture. This large scale unemployment apart from lowering the productivity adversely affects the economy in other respects too as would be explained later.

Capital

That capital has a definite role in agricultural production is long recognised. One of the main ills of Indian agriculture has been the paucity of capital during the past several decades. One has to reflect a little on the causes that led to the present state of affairs. Among these may be mentioned the tenancy system, the booming pressure of population on land, the declining fertility of the soil and a whole host of others. We have seen earlier the systems of tenancy that have been prevailing in the country. There was a lot of rack-renting of the tenants by the landlords and this left little for the peasant even to meet his daily requirements, not to speak of investment. Not only was there an absence of funds with the peasants, but there was also no facility for obtaining credit in villages on low rates of interest. The rates prevailing were invariably usurious, and in many cases the farmers preferred to let their land deteriorate rather than take loans at such high rates. The rate of interest charged by money-lenders, to quote only a few of the findings of the Rural Credit Survey, was as high as 70% in Orissa, 40% in Tripura, 40% in West Bengal and Himachal Pradesh, 20% in Uttar Pradesh and 27% in Bihar. Such high rates of interest prevented investment and profitable cultivation by farmers. This progressively deteriorated the condition of the farmer so much so that the farmer's condition apparently was in a vicious circle and looked irredeemable for a long time.

Technique

The modern view is that technique is a function of capital and, therefore, a discussion on technique in Indian agriculture immediately following that on capital is only relevant to the point. Techniques need renovation with changes in time. One peculiarity with Indian agriculture is that for a long time, there were no changes in the techniques employed in cultivation while the needs were increasing for larger output. Since the 18th century, agriculture has been revolutionised in most of the Western countries. It is this which has mainly contributed to economic development in those countries. On the other hand, in India, age-old methods of cultivation are being used even now. This technological backwardness has been partly responsible for the stagnation in Indian agriculture.

Indian agriculture at the beginning of the period of our independence was at a very low ebb because of the shortage of land, its utilisation pattern, the ineffective use of labour, non-availability and slow formation of capital, backward technologies, and the existence of many disincentives like landlords, who rack-rented the tenants, unprofitable cultivation etc. The task that faced the planners, therefore was in no way a small one. They had to take up the challenge to change the face of the country from a stagnant, disincentive, orientated agricultural background to a progressive and developing industrial economy.

CHAPTER II

INDIAN AGRICULTURE AND THE PLANS

1. Agriculture and Balanced Growth

Though no single definition of the term economic development may be entirely satisfactory, it is possible to state, in general terms that development is a "process whereby an economy's real national income increases over a long period of time". The general result of the process is growth in the economy's national product. Theoretically, this growth may be in the sector of primary industry, *i.e.*, agriculture, forestry and mining or in secondary industry, *i.e.*, manufacturing or in tertiary industry, *i.e.*, services of all sorts. An important view is to plan for a simultaneous and balanced growth of all the sectors of the economy. Now balanced growth does not mean at all that all the sectors should grow at the same rate. As income increases in a society, its demand for agricultural commodities, industrial goods and for various services does not grow in the same proportion. If there are backlogs of hunger, starvation, unemployment and malnutrition, the demand for food might rise rather rapidly at first; but after this initial period is over, the demand for manufactures will catch up and outpace that of food and many agricultural products. At a still later stage the demand for services may exceed that for food as well as industrial products. In short, even in a period of balanced growth, the income elasticities of demand for goods of various sectors will differ widely. In general, the income elasticity of demand for services and for manufactures exceeds unity while that for food is less than unity. And hence, if shortages are not to arise, the supplies of the products of various sectors will have to be forthcoming at differential rates : the output of services will have to rise faster than that of manufactures and that of manufactures faster than that of agriculture.

This last statement perhaps needs two important qualifications. Some manufacturing industries such as those producing jute goods,

cotton textiles, edible oils, etc., depend almost entirely on the product of agriculture, so that in their case the rate of growth of the relevant agricultural output will have to be as fast as the rate of growth of the dependent industry, unless the raw material is imported. Secondly, in the early phase of development when there are backlogs of hunger and malnutrition and the demand for food is increasing rapidly the required growth of agriculture may be nearly as fast as the growth of manufactures or services. This is the reason for the oft-made statement that in the early period of build-up, the stresses and strains on agriculture are serious and that the agricultural sector has to develop really rapidly if imbalance is to be avoided and general development is not to peter out.

The need for a balanced growth of all the sectors arises out of the mutual dependence of sectors. If agriculture stagnates, the capitalist sector cannot grow. Capitalist profit would remain a small part of the national income and saving and investment would remain correspondingly small. Smooth economic development, therefore, requires that industry and agriculture should grow together. But in backward economies the sector which least responds to economic growth is agriculture, so much so that it acts as a brake on the growth of other sectors. However, rapid growth of industry calls for the rapid growth of agriculture too. The industrial workers would want more food ; the factories would require labour from the countryside, expanding markets of the consumers would be needed to take up the output of consumer goods, or alternatively the savings or tax receipts from farmers would be needed to finance industrial construction. Further,¹ as Professor Arthur Lewis points out, innovation in one sector of the economy is checked unless other sectors expand appropriately. If economic development is concentrated upon industrialisation to the neglect of agriculture, there would then occur an acute shortage of agricultural products and an inflation of their prices, which would drive up all other prices in a spiralling movement. There is also difficulty in disposing of the manufactures at a profit. If the farmers' real incomes rise, real wages of factory workers must also rise in sympathy, while the prices of factory products are being kept relatively low.

1. Lewis, W. Arthur, *Theory of Economic Growth*,

Alternatively, if farmers' real incomes are kept low they cannot buy manufactures, which cannot then be sold profitably unless foreign markets are developed.

2. Role of Agriculture :

(a) *Manufacture for Exports* : In an open economy, it may be possible to attain the required balance by increasing manufacture for exports. But this has its disadvantages. For in such cases, the tendency develops for an over-concentration upon exports. This is as disadvantageous as an over-concentration in any other sector. The country which is importing the product of these industries may sooner or later enter the field, producing the same goods and this may check further exports. In such a contingency, the whole superstructure of the exporting industry may be shaken up badly and suffer a crash.

But the expansion of exports has the advantage of being the easiest means of starting the economy on its growth. This is so because "in practice in most backward economies the sector which usually responds least well to growth in other sectors and which therefore, acts as a brake on all economic growth is the agricultural sector which produces food for home consumption"¹. This is more so in over-populated countries which cannot hope to increase their agricultural output for food as rapidly as their demand for food increases. But even such countries should give great attention to agricultural production because sooner or later the disadvantage of concentration on exports would show up in the form of adverse balance of trade. If nothing is done to raise the productivity of labour engaged in producing food articles, they would form a reservoir of cheap labour for employment in mines, plantations etc. Unlike food articles, the productivity of commercial crops shows a rapid increase. The case of sugarcane is usually quoted as an example, for here is an industry in which production per acre doubles and trebles within a few decades. Since the labour employed on these crops is cheap, the products are sold at rates advantageous to industrial countries, and this leaves the under-developed country with relatively little margins for plough-back and expansion, apart from keeping the subsistence food sector continuously at a subsistence level.

1. Lewis, W. Arthur : *Theory of Economic Growth*, p. 279

(b) *Avoidance of Inflation* : An underdeveloped country which has embarked upon a programme of development will have to increase its agricultural production, not only on grounds of avoiding a serious adverse balance of payment—for agricultural output is not only exportable and earns foreign exchange, but is also an import substitute and saves foreign exchange—but also on grounds of avoiding inflation. Such an inflation derives its force in developing economies from an increase in population, an increase in employment in the face of industrialisation and, as noticed earlier, a relatively high income elasticity of demand for food as well as for cash crops in the early phase of growth.

Thus a larger output in agriculture is easily seen to be a prerequisite for economic growth. How then could larger output be attained? Increases in agricultural output could be brought about by (i) increasing the area under cultivation, or (ii) increasing the yield per acre, or indeed by (iii) undertaking both these at the same time.

There are limitations in effecting all these methods. Firstly, the cultivable land in India is so limited that it is not possible to extend the area under cultivation without special effort. Most of the uncultivable area is either dry land, area that is infested with weeds, bushes, or is hilly tracts. A programme of reclamation has to precede before such extensions can be made. Wherever necessary, these programmes will have to be supplemented by irrigation facilities.

Increase in yield per acre is a function of technique and changes in technique need large-scale investments in providing better seeds, better implements, more fertilisers and manure, ample supply of water and even in dispersal of techniques.

The launching of our Five-Year Plans marks the first earnest effort on a nation-wide scale to eradicate the different types of evils persisting in the economy—both agricultural and non-agricultural sectors. Our effort in the following pages is to focus attention on the Plan efforts on the agricultural front.

Objective of the First Five-Year Plan :

In the previous chapter we have seen the general situation in which Indian agriculture was at the beginning of the Plan period.

The First Five-Year Plan envisaged substantial increases in agricultural production for foodgrains as well as commercial crops. In order to achieve this, the Plan set up the following targets :

TABLE IX

Commodity	Unit	Production in last year	Targets of additional production	Percentage increase
Foodgrains	m. tons	54.0	7.6	14
Major oil seeds	m. tons	5.1	0.4	8
Sugarcane (<i>gur</i>)	m. tons	5.6	0.7	13
Cotton	m. bales	2.9	1.3	45
Jute	m. bales	3.3	2.1	64

The targets proposed in the Plan were to be realised through development programmes relating to major and minor irrigation works, extension of cultivation, reclamation and intensive farming based upon the application of the results of research. Considerable stress was laid on the conservation of existing resources in particular of forests and the soil. Diversification and expansion of the rural economy was sought through emphasis on the development of dairying and horticulture and through the growth of village industries, wherever possible with the aid of power and improved tools. As the rural economy has been largely starved of financial resources, a substantial programme for providing finance for agriculture was proposed.

With these objectives in view, it was considered that under the First Five-Year Plan, agriculture including irrigation and power must have the top-most priority. This is evident from the following table which gives the outlay on various items under the First Plan,

TABLE X

	Rs. Crores	Percent of total
1. Agriculture and Community Development	361	17.5
2. Irrigation	168	8.1
3. Multi-purpose Irrigation and power projects	266	12.9
4. Power	127	6.1
5. Transport and Communication	497	24.0
6. Industry	173	8.4
7. Social Services	340	16.4
8. Rehabilitation	85	4.1
9. Others	52	2.5
	2,067	100.0

This large emphasis has been given mainly because of the realisation that without a substantial increase in the production of food and raw materials needed for the industry it is impossible to sustain a higher tempo of industrial development. It was also considered necessary on economic as well as on other grounds to first of all strengthen the economy at the base and to create conditions of sufficiency and even plenty in respect of food and raw materials. These are the wherewithals for further development. The experiences of countries like Japan and Great Britain were profitably kept in mind at the time of the formulation of the Plan. Japan, for instance, increased its agricultural production by 80 per cent in a generation and still required large-scale imports of food and raw materials. Britain, which in the earlier stages of economic development was in a strong position because of the earlier revolution that had taken place in farming practices and techniques also emerged at the end of the process an importer of food and raw materials.

Achievements of the First Plan

The First Five-Year Plan came to a close in 1956. The attainments under this Plan were in many respects more than our expectations. In the following Table is given the course of agricultural production during the First Plan period :

TABLE XI

Commodity	Unit	1951-52	1952-53	1953-54	1954-55	1955-56
Cereals	m. tons	42.9	49.2	58.3	55.3	53.3
Pulses	m. tons	8.3	9.1	10.4	10.5	10.1
Total food-grains	m. tons	51.2	58.3	68.4	65.8	63.4
Major oilseeds	m. tons	4.9	4.7	5.3	5.9	5.5
Sugarcane	m. tons	6.1	5.0	4.4	4.4	5.8
Cotton	m. bales	3.1	3.2	3.9	3.9	3.9
Jute	m. bales	4.7	4.6	3.1	3.1	4.1

The Index Number of agricultural production increased from 95.6 in 1950-51 to 103 in 1952-53. It rose to the peak level of 116.4 in 1954-55. In 1955-56 the index showed a slight fall to 113.7. Thus during the First Plan period the output of agricultural commodities increased by a total of 19% over that of 1950-51 level. The planned targets of production were exceeded in the case of food-grains and oilseeds even in 1953-54. In the case of cotton the target was exceeded in the year 1954-55. Sugar production showed a record rise reaching 15.9 lakh tons in 1954-55.

True that the agricultural production increased during the First Plan period considerably in that the production of 64.8 million tons of foodgrains in 1955-56 was about 11 million tons above the production level of 1949-50. This increase, however, was mainly the result of good crops due to seasonal rains etc., and not so much due to increase in production potential. The target of 7.6 million tons of additional foodgrains production represented not an estimate of actual production, but mainly increase in the production potential on account of the completion of various programmes in the Plan, such as major and minor irrigation works, improved seeds, reclamation and others. A judicious weighing of the factors shows that taken in this light, our attainment during the First Plan period fell short of 6 million tons.

During the Plan period, however, there were large improvements in the factors favouring larger output. About 10 million acres of land have been brought under irrigation from minor irrigation

works and 6.3 million acres under large and medium irrigation works. The actual additional irrigation was just over 4 million acres. Capacity for power generation increased from 2.3 million kws to 3.4 million kws. With the help of the Central Tractor Organisation over a million acres of land were reclaimed. Besides this, about 5 million acres have been developed by cultivation through programmes such as assistance for mechanised cultivation, bunding and levelling and reclamation of land by manual labour. The extension of cultivation was a larger contributory factor than was anticipated. The total cropped area has increased from 326 million acres before the Plan to 352 million acres. The area under food crops alone increased from 257 million to 272 million acres while that under cash crops increased from 49 million to about 60 million acres. There has notably been a shift in the proportions in that the area under cash crops increased from 15 per cent of total area to 17 per cent while that under food crops diminished from 79 per cent to 77 per cent. This drift is indicative of larger commercialisation of agriculture which one would naturally expect in a developing economy.

Approach in the Second Plan

At the time of the formulation of the Second Plan, the need for a long term programme of development was recognised. A long term view was considered necessary in order to achieve a closer inter-dependence between agricultural and industrial development, and for the best possible use of material and human resources. The Plan, however, had as its primary objectives the provision of adequate food to support the increased population and the raw materials needed for a growing industrial economy and also to make available larger exportable surpluses of agricultural commodities. The Second Five-Year Plan also specifically stated that the large increases in agricultural output envisaged in the Plan can only be achieved through active co-operation of villages.

The factors that were specially considered while formulating the Second Five-Year Plan were (1) increase in the total population, (2) increase in the urban population, (3) the need to improve *per capita* consumption, (4) the need to counter possibilities of inflationary pressures resulting from the implementation of the Second Five-Year Plan, and (5) effects on food consumption of increase in national income and changes in its distribution.

It was estimated that by the end of the Second Five-Year Plan, the *per capita* consumption of food grains would increase to 18.3 ounces per adult and accounting for this as well as the increase in population, the total food requirements in 1960-61 will be of the order of 75 million tons.

It was recognised that the possibilities of increasing area under cultivation are extremely limited and, therefore, one of the aims was to make a proper use of the available land. The following were considered the main elements in agricultural planning :

- (1) Planning of land use,
- (2) Determination of targets both long-term and short-term,
- (3) Linking up of development programmes and Government assistance to production targets and the land use plan, including allocation of fertilisers etc., according to plan ; and
- (4) An appropriate price policy.

The Second Plan also recognised the need for decentralised planning. To this end it was considered that each district and, in particular, each national extension and community development project area should have a carefully worked out agricultural plan. It was also considered essential to indicate for villages the targets to be aimed at, the broad distribution of land between different uses and the programme of development. The crop pattern envisaged by these local plans were to be influenced through such incentives as the provision of irrigation, credit, and marketing facilities, provision of fertilisers, and intimate contact with the cultivator on the part of extension workers and especially the village level workers.

The plan kept the following targets :

TABLE XII

Commodity	Unit	Production at the base (1955-56)	Target for (1960-61)	Additional Production	Percentage increase
1. Food-grains	m. tons	65.0	75.0	10.0	15
2. Oilseeds	m. tons	5.5	7.0	1.5	27
3. Sugarcane (<i>gur</i>)	m. tons	5.8	7.1	1.3	22
4. Cotton	m. bales	4.2	5.5	1.3	31
5. Jute	m. bales	4.0	5.0	1.0	25

However, while considering the outlay under the Second Five-Year Plan, there was a lesser emphasis with regard to investment in the agricultural sector. Table XIII gives the allocation of resources in the two Plans.

TABLE XIII

Heads of Development	First Five-Year Plan		II Five-Year Plan	
	Total Provision (Rs. crores)	Per cent	Total Provision (Rs. crores)	Per cent
1. Agriculture and Community Development	357	15.1	568	11.8
2. Irrigation and Power	661	28.1	913	19.0
	1,018	43.2	1,481	30.8
3. Industry and Mining	179	7.6	890	18.5
4. Transport and Communications	557	23.6	1,385	28.9
5. Social Services	533	22.6	945	19.7
6. Miscellaneous	69	3.0	99	2.1
	2,356	100.0	4,800	100.0

It may be seen that while in the First Five-Year Plan, 43.2% of the allocations were on agriculture and irrigation including power, under the Second Plan only 30.8 per cent were kept aside for these items. One of the factors that may have been responsible for this apparent neglect of agriculture has been the optimistic outlook and complacency of some sort that came as a result of our outdoing the targets under the First Five-Year Plan. We failed to recognise at that time that much of the large increases were due to favourable seasons that went with the Plan. Of the Five years, three were very favourable for crops and it is this which was to a very significant extent responsible for outdoing the Plan targets. It was pointed out earlier that considered from the targets and outlays made under the First Plan, there was in fact a failure amounting to several millions even in the production of foodgrains.

Even at the beginning of the Second Plan period, it was recognised that the programme of rapid economic development with special emphasis on heavy industries embodied in the Plan would demand a much larger increase in agricultural production. On account of this the provisional targets mentioned in the report of the Plan were revised and the following targets were accepted in November, 1956 for the Second Plan period : foodgrains 80.5 million tons ; oilseeds 7.6 million tons ; sugarcane 7.8 million tons ; cotton 6.5 million bales and jute 5.5 million bales. Thus, in all major items of agricultural commodities there was an upward shift in production targets.

In order to attain this the agricultural plans of States were reviewed to ensure that the programmes for the multiplication of improved seeds, for the use of fertilisers, irrigation, soil conservation, etc., were implemented so as to yield the utmost benefits within the shortest time. With regard to the important crops of paddy and wheat which had secure irrigation facilities or assured rainfall it was suggested to State Governments that there should be carefully worked out programmes for covering every bit of land with improved seed and the supply of fertilisers and organic and green manures ensured. It was also recognised that at later stages in the Plan it might be necessary in some instance to provide small additional allotments.

Unfortunately for us, the Second Plan started with a strain on resources both internal and external. Wholesale prices had started to rise even before the Plan commenced and the upward trend continued until August, 1957. The balance of payments situation also showed signs of deterioration. It took an adverse turn about April, 1956. The current account deficit over the eighteen months from April, 1956 to September, 1957, amounted to a total of Rs. 591 crores.

Many factors, some of them internal and the others external combined to heighten the stresses and strains much earlier than anticipated. On the agricultural front, particularly, in the closing years of the First Five-Year Plan, food production receded significantly mainly due to unfavourable weather. This exploded the myth of a very elastic agricultural economy which we took ours to

be. The index of national income increased by less than 4 per cent between 1953-54 and 1955-56 from 116.0 to 120.5. This compared to the very large increase in the Plan expenditure in the last two years of the Plan was indicative of a very poor performance.

Apart from these shortfalls, there were the rising trends in prices. The bulk of the deficit financing of the First Plan period occurred during the later years of the Plan. As a result the money supply with the public went up by Rs. 127 crores in 1954-55 and by another Rs. 264 crores in 1955-56. Bank credit (of the scheduled banks) recorded an increase of 22 per cent in 1955-56. Further the publication of the Second Plan with its optimistic outlook and target created a psychological climate favourable to a further spurt in investment. There was also certain extent of liberalisation in the import policy. All these factors contributed or added to the strains on the balance of payments and exerted an upward pressure on domestic prices.

These developments and inflationary pulls pushed up the cost estimates of some of the projects in the Plan. This made the original financial outlay inadequate. Further certain projects of high priority were included in the Plan which necessitated a revision of the outlay. The revised outlays on Agriculture and Community Development, and Irrigation and Power were as under :

Headings	Outlay (Rs. crores)	Per cent of Total
1. Agriculture and Community Development	568	11.8
2. Irrigation and Power	860	17.9

With the working of the Plan for two years 1956-57 and 1957-58 it was considered essential to further revise the outlays and as far as they relate to agriculture, community development, irrigation and power they are as under. This revision was necessary in order to correspond the outlays with the resource position as it was known to exist in 1958 :

Headings	Outlay (Rs. crores)	Per cent of Total
1. Agriculture and Community Development	510	11.3
2. Irrigation and Power	820	18.2

The above discussions show that Agriculture did not have a smooth sail during the Second Plan period. Even towards the end of the First Plan period, it turned out to be falling far behind the high expectations and optimistic outlook placed on it. The progressively increasing trend in production witnessed in the first three years of production, started showing a reversal. This necessitated looking at the problem of agricultural development more realistically.

One factor that has been responsible for a not too rapid increase in agricultural output compared to the phenomenal growth in the size of investment is the existence of a certain time lag between investment and output, that of necessity to exist in all types of developmental activities and particularly of agriculture. Large investments in Irrigation projects have a certain gestation period. This is the period between the initiation of these projects and their yielding the benefits. Apart from this there are certain factors, that are associated with the nature of backward economies. They emanate from the nature of peasants in these countries. Traditions play a very significant role in shaping the techniques and tools employed in cultivation and they hardly change with mere availability of modern techniques. It takes time before the peasants even know of available resources like irrigation facilities, better seeds, manure etc. Even when they know of their existence, they do not readily adopt these newer techniques. It only spreads gradually and through demonstration effects of the more adventurous among them. Thus mere addition of irrigation potential, or availability of better seeds, manure etc. do not by themselves increase agricultural output. However, when we view the Indian agriculture during the period after independence there is ample evidence of the farmers adapting themselves to new production techniques. It is in fact these slow changes that have been responsible for the significant growth that has taken place in Indian agriculture. This would be discussed in the next Chapter.

Agriculture under the Third Plan

Before we proceed to look into the changes that have taken place on the production front and the factors that were responsible for such changes, a reflection on the Third Plan would be advantageous. Because of the apparent failure of agricultural output to keep up with the demand, the production of sufficient foodgrains has been given the highest-priority under the Third Plan. It has been long realised that once the capacity for production has been created within a comparatively short period, it can be adopted to meet the changing needs of the community. Over a period the aims to be achieved are the development of a diversified and intensive system of agriculture, including animal husbandry, dairying, production of meat, fish, poultry etc ; provision of a balanced and adequate diet to the entire population ; and the development of commercial crops both to meet the increasing requirements of industry and exports. The draft outline that has been published has indicated that the development of agriculture based on the utilisation of man-power resources of the countryside and the maximum use of resources holds a key to the rapid economic development of the country.

Development of agriculture, it is recognised calls for extension of irrigation on a large scale as well as for increased production of chemical fertilisers. From the point of view of long-term development the success depends on :

- (1) adoption of technological changes specially the adoption of scientific agricultural practices and improved implements and equipment.
- (2) fuller utilisation of man-power resources and the organisation of maximum local efforts.
- (3) re-organisation of the rural economy along co-operative lines, including the provision of services, credit-marketing, processing and distribution, co-operation in production and diversification of the occupational structure.

To these forms of development the Plan generally addresses itself.

Before formulation of the Plan, for nearly a year studies have been undertaken both at the Centre and in the States with a view to

working out suitable targets for agricultural production. These estimates are intended to provide a basis for detailed agricultural programmes to be undertaken at the local level, in districts, blocks and villages, in relation to practical possibilities which are open to them and the efforts which can be actually mobilised. Much attention is paid to devolution of responsibility to the local level, for the success of agriculture depends finally on local efforts. Towards this it is considered that keeping in view the national and State targets in view, the district and block extension worker and the local leadership in each area as represented in co-operatives, panchayats and panchayat samitis should formulate their own targets. In formulating these targets, attention has to be given to :

- (1) customary obligations ; digging field channels for utilising irrigation, maintenance of tank bunds, desilting of tank beds and maintenance of field channels.
- (2) arrangements for the multiplication of approved seed, production of organic and green manures, distribution of these and of fertilisers.
- (3) Contour-bunding and dry farming practices.

The above programmes if undertaken, would, besides contributing to increase in agricultural production, also help in the utilisation of surplus man-power in the rural areas.

The technical programmes for increasing agricultural production envisaged for the Third Plan are (1) irrigation, (2) soil conservation, (3) supply of fertilisers and manures and (4) better ploughs and improved implements.

Irrigation :

The additional area to be benefited from large and medium projects will be about 13 million acres (about 11·5 million acres if double cropped area is accounted). As for minor irrigation works, it is considered in the interests of the requirements, that an additional area of about 13·5 million to 14 million acres should be irrigated from such works. Taking account of the double-cropped area the net area to be irrigated from these sources it is estimated would be about 10 million acres. Annually a part of the irrigated area becomes unusable. Considering such depreciations and the fact that

some of the irrigation works undertaken overlap and stabilise existing ones the net irrigated area is expected to be increased from 70 million acres to 90 million acres.

Soil Conservation and dry farming and land reclamation :

Since the irrigation programmes are inadequate to cover the unirrigated areas it is essential that adequate soil conservation programmes should be undertaken to increase the agricultural production in such areas. The following scheme has been tentatively worked out in this respect keeping in view the conditions and possibilities of each area :

	Million acres
Soil Conservation with contour-bunding ..	13
Other Soil conservation Programmes including river valley projects ...	2
Dry Farming Practices ...	40
Land Reclamation ...	1
Reclamation of Saline and Alkaline lands ...	0.4
Flood Control, Drainage and Water-logging...	5.0

Fertilisers and Manures :

It is proposed to increase the use of fertilisers and manures significantly during the Third Plan period. The programme is to increase the consumption of nitrogenous fertilisers from about 360,000 tons at the end of the Second Plan to 1 million tons in terms of nitrogen and of phosphatic fertilisers from about 67,000 tons to about 400,000 to 500,000 tons in terms of P_2O_5 . It is also anticipated that the programme of urban composting will benefit 24 million acres. The additional area to be benefited from urban composting is estimated to be about 50 million acres.

Seed Multiplication :

The need for providing better seeds was taken up seriously in the Second Plan. In general, a seed farm of 25 acres was provided in each Community Development Block. It is estimated that by 1961 about 4,000 seed farms will have been set up. In the Third Plan it is considered that the better varieties of seed required for each seed farm should be multiplied in the village itself from the foundation seed supplied by the seed farm. It is proposed to set up as many seed farms as may be necessary during the ensuing Plan period.

Plant Protection :

One of the enemies of our agriculture is the existence of the pest. On a rough estimation one could say that about one-eighth of the crop every year is being destroyed by pests. In Red China, from reports available, we know that the destruction of birds has been taken up quite seriously as a national campaign. It is the pest, in fact, which is our public enemy number one, and a campaign of the magnitude reported to have been launched in China has to be undertaken in our country also. Though no such scheme is proposed, it is intended during the Third Plan period to strengthen the organisations for pest and disease control that exist in some of the States. By the end of the Third Plan period, these organisations may be able to extend protection to a total of 75 million acres.

Better ploughs and improved agricultural implements :

Bad workmen always complain of their tools is an old saying. In India there has been no such complaint from the farmers in spite of the fact that the tools are genuinely bad. Due to a stagnation in the technique there has been no effort in the past to improve the tools. With a view to obviate this, surveys of implements in use in different parts of the country have been undertaken by the Indian Council of Agricultural Research. Four regional research-cum-testing centres for bullock-drawn implements are being set up. These centres are intended to test and improve upon existing implements and also to facilitate their manufacture and supply. With the studies that have been already made, it is proposed to prepare a detailed development programme for agricultural implements as an essential feature of the Third Plan. This is to include (a) selection and demonstration of the improved implements which have been already established, (b) training of village artisans in the repair and manufacture of improved implements, and (c) closer co-operation between research and extension agencies and those engaged in manufacture of implements, along with more satisfactory arrangements for the supply of steam and transport and distribution. It is also proposed to make arrangements in every State for the establishment by the Government of at least one centre for the manufacture of agricultural implements of improved types to which other manufacturers can turn for technical and other guidance. Another aim is to provide facilities at the deve-

lopment blocks including credit for the adoption of improved implements.

Intensive agricultural districts programme :

There is also the proposal for making intensive effort to increase agricultural production in selected areas where, on account of the availability of irrigation and assumed rainfall, conditions appear favourable. Initially, one district is selected in each State for this purpose. This is considered to be a very adventurous beginning to reach all farmers through co-operatives and panchayats and to organise village production plans which will involve all agricultural families. In the past due to the gestation period involved in irrigation and other projects becoming fruitful the Community Development Blocks could not reach all families. The present system is aimed at overcoming this shortcoming.

Targets of Agricultural Production :

The targets of agricultural production with regard to some of the important groups of crops are given below :

TABLE XIV

Commodity	Unit	Expected production in 1960-61.	Target of total production in 1965-66	Percentage increase during 1965-66 over 1960-61.
Foodgrains ...	m. tons.	7.50	100-105	33-40
Oilseeds ...	m. tons	7.2	9.2-19.5	28-32
Sugarcane ...	m. tons	7.2	9.0-9.2	25-28
Cotton ...	m. bales	5.4	7.2	33
Jute ...	m. bales	5.5	6.5	18
All agricultural Commodities				30-33

One of the changes that have been made in the proposed Plan compared to earlier ones is keeping the targets of agricultural production within a range instead of a specific one. This was done because of the risks that are usually associated with agricultural production.

Outlays under the Third Plan :

The general pattern of investment in the Second Plan is being continued in the Third, but in the public sector there is greater

emphasis on agriculture. The Plan outlays on agriculture appear under several heads as follows :

Heads	Outlays (Rs. crores)
Agriculture and allied heads ...	625
Community Development & Co-operation ...	400
Large and medium irrigation ...	650
Production of fertilisers ...	240
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	1,915
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In addition, account may be taken of Rs. 800 crores which is estimated to be the likely investment in the private sector. Besides these, account should also be taken of the programmes suggested by the Working Group on Co-operation for securing finance from co-operative agencies to the extent of Rs. 400 crores of short-term credit and also Rs. 160 crores of medium-term credit and Rs. 115 crores of long-term credit being outstanding at the end of the Plan period.

It is also proposed to give larger emphasis under the Third Plan for finding out the most effective use of the outlays before they are actually spent. For instance, the proposal for systematic surveys of the possibilities of minor irrigation would facilitate the schemes in each area which is likely to yield the greatest benefits.

On the whole the experiences that we have gained during the two plans, particularly the 2nd Plan, have helped us to have a more realistic approach of the next Plan. The large emphasis now placed on agriculture shows the realisation of the possibility of our expectations from agricultural sector giving way if we do not have a firm basis.

That there have been some shortfalls in our expectations from agriculture during the Second Plan period cannot be denied by anyone. But to exaggerate these shortfalls would be too unrealistic an approach. During the years of our two Plans a substantial ground-work has been prepared for a progressive agriculture within the country. We may have had failings but these failings compared to the vast experience we got appear to be negligible. In the Chapter to follow we propose to deal at length with these gains and the consequent changes that have come about in our agriculture.

CHAPTER III

THE CHANGING AGRICULTURE

The task before the country was to convert a disincentive orientated and stagnant agriculture into a progressive one responsive to the increasing needs in the wake of rapid industrialisation and a fast growing population. For many years writers on Indian Economics have presented a very gloomy picture of our agriculture. This trend though not dominant still continues in certain respects. However, a close survey of developments that have taken place in the past decade and more will show that there are reasons for us to be optimistic.

We have seen in Chapter I that Indian Agriculture had all the characteristics of a backward economy at the beginning of our era of independence. It would be useful to recall these characteristics in a brief manner before we proceed further.

There were various disincentives in the form of oppressive tenancy laws, extremely small holdings and narrowly fragmented holdings. Added to this was the increasing pressure of population which increased by 40% during the period between 1900 and 1951. The scope for employment in sectors other than agriculture was extremely limited. Due to the pressure on land and rackrenting by the landlords the peasants were reduced to abject poverty with no surplus to be invested on land. Credit was also not readily available to the cultivators or if available it was always at a very high cost. These factors were responsible for the absence of capital formation. Unfortunately there are no studies available to show the extent of capital formation in the agricultural sector in the years prior to independence. If proper studies were available, one need not have been surprised to find capital formation as a negative phenomenon. The peasants were also uneducated and in many cases steeped in ignorance even of the need for a larger income. The demand for income of the farmer in the under-developed countries, it is considered, is sticky and the backward sloping supply curve is usually attributed to him.

Changes and initiation of changes :

However, the scene has changed and on all those fronts where there has been no change, there has at least been an initiation of change. In the following pages we will examine the changes that have taken place in various fields and the initiation of changes in others. These changes, no doubt, have already yielded valuable results in the past decade, and some of them are very potent and are likely to bring about lasting changes. In the first place, we will examine in a brief manner the changes that have already taken place and as a next step the changes that have been initiated.

Large changes have come about in the land utilisation pattern since the year 1947-48. There has not only been an extension in the area under cultivation, but also a more intensive use of the area that was already under the plough. Apart from these changes, there were also changes in different classes of land in directions found to be of use to agriculture. One of the changes that has taken place and has a great relevance in the field of planning is the increase in the reported area from 586 million acres in 1947-48 to 721 million acres in 1956-57 (the latest year for which we have data). This has thrown wider opportunities for planning the land utilisation pattern and in a more realistic manner. In the following Table we give the classification of area as was known to exist in 1956-57.

TABLE XV

Classes	Area (in million acres)		Percentage to total reporting area	
	1947-48	1956-57	1947-48	1956-57
Area under forests	88.58	126.10	15.4	17.5
Area not available for cultivation ...	101.34	116.22	17.2	16.1
Other uncultivated land excluding fallow land	92.44	97.72	15.7	13.6
Fallow Land	60.92	58.49	10.2	8.1
Net Sown Area	245.51	322.44	41.5	44.7
Total Reporting Area	589.8	720.97	100.0	100.0

If we assume on a *priori* that the different classes of land for which no statistics were available till 1947-48 were distributed in a proportion similar to that of a reported area, it is possible to see the changes that have taken place in the land utilisation pattern. Such an assumption is not likely to err on the wrong side, because of the fact that the areas for which statistics were available were usually the cultivated or cultivable land and if in spite of such an assumption we are able to notice changes in the proportion cultivated, the assumption is not without justification. From the above table it can be seen that the area under forests and the net cultivated area as proportions of total reporting area have shown positive changes. The proportionate area under forests increased from 15.4% to 17.5% and that under net sown area increased from 41.5% to 44.7%. Both these changes no doubt have been in a desirable direction, and they were brought about by proportionate reduction in other classes of land like fallows, and other uncultivated land.

Not only has there been increase in the net sown area but there has also been an increase in the area cultivated, more than once. The gross cropped area has thus increased from 278.16 million acres in 1947-48 to 368.46 million acres in 1956-57. This was an increase of nearly 33% in the span of a decade. This large increase in the area under cultivation has been possible because of the appreciably high increases in the area irrigated. The irrigated area increased from 46.6 million acres to 64 million acres during the same period. This is an increase of about 38%. There seems to be some sort of a relation between the rate of increase in the area cultivated and the area irrigated which is not merely coincidental.

In the sphere of labour, it is very difficult to say that there has been any appreciable change. Recent studies conducted by the National Sample Survey show that there has been some reduction in unemployment. Such studies as are available, however, do not give the right estimate of changes. The Census of 1961, it is anticipated, will throw much light on this problem. Apart from unemployment, we have also not been able to shift many from the agricultural to the non-agricultural sector. This was due to the rapid growth of population in the urban sector. Prof. A. M. Khusro of the Institute of Economic Growth has in a recent study estimated that it may

not be possible for the non-agricultural sectors to absorb any population from the agricultural sector till 1972. He has arrived at this estimate after taking into account the growth of investment in these sectors and the rate of growth of population in the urban as well as the rural areas. The rate of growth in population in the urban areas, it is estimated is double that of the rural areas. This is partly due to immigration into urban areas and mainly due to national growth.

Capital :

There has been a change in climate with regard to investment in Indian agriculture. This fact has been brought out amply in the Report of the Rural Credit Survey and in the Farm Management Studies conducted under the auspices of the Ministry of Food and Agriculture. The value of capital in Indian agriculture has been estimated by the present author in an article in the AICC Economic Review, to be of the order of Rs. 18,574 crores in 1951-52 and Rs. 22,223 crores in 1954-55. This excludes the value of capital assets owned by the State in the agricultural sector. The rate of capital formation has been estimated to be about 2.5 per cent per annum. These estimates have been arrived at after taking into consideration the studies by the Rural Credit Survey, the Farm Management Studies and the outlays under the two Five-Year Plans.

In the study referred to above the author has also tried to show that it is this large spurt in the formation of capital which has been primarily responsible for changing agriculture from its stagnant position to a rapidly developing and progressive one.

Technique :

It is not possible to show categorically to what extent techniques have changed during this period. The growth of capital itself is an indication of the change in techniques. Another indicator is the use of fertilisers and manures. The supply of nitrogenous fertilisers increased from about 100,000 tons in 1955 to about 240,000 tons of nitrogen in 1959 ; the supply of phosphatic fertilisers also increased from 13,000 to 55,000 tons during the same period. Yet another indicator is the changes that have come about in the use of implements. The following Table shows the changes in these over the period 1945 to 1956.

TABLE XVI

Implements						Unit	1945	1951	1956
Ploughs	...	...	...	...	...	In millions	27.8	32.7	38.0
Carts	...	...	...	...	...	In millions	8.5	9.9	11.0
Sugarcane crushers	...	...	...	...	...	In thousands	490.0	526.0	568.0
Oil engines	...	...	...	...	...	In thousands	12.0	82.0	122.0
Electric pumps	...	...	...	...	...	In thousands	9.0	26.0	47.0
Tractors	...	...	...	...	...	In thousands	5.0	9.0	21.0

These go to indicate that there has been rapid development in the techniques employed in our agriculture.

Community Development :

The factors which we have mentioned earlier as less discernible are the introduction of community development, co-operative movement, larger credit facilities etc. Community Projects and National Extension Service have an important place in all sectors of development which bear closely upon the welfare of the rural people. In the First Five-Year Plan community development was described as the method and rural extension as the agency through which the process of transformation of the social and economic life of villages was to be initiated. Once the impulse has been given and the first stage of the journey has been covered, a programme like this goes on by itself. National Extension and Community Development are intended to play a large part in promoting the diversification of the agricultural economy and in enhancing agricultural production. They are also intended to increase greatly the reserves of skill and the habit of improvisation of new techniques. The project areas were also to serve as centres through which programmes in different fields of development are to be carried out, notably in agriculture and allied activities, co-operation and land reforms etc. Since its inception, a little over eight years ago, the community development programme has been introduced in over 2,000 blocks and now serves a population of about 194 million. By the end of the Second Plan, the programme will extend to about 3,100 blocks comprising about 400,000 villages.

Land Reforms :

Land reform measures are aimed to attain mainly two objectives. The first is aimed to remove such impediments to agricultural production as arise from the rural structure inherited from the past like subdivision and fragmentation of holdings. This should help creating conditions which would raise the levels of efficiency and productivity in agriculture. The second object is to eliminate all elements of exploitation and social injustice with the agrarian structure by providing security of tenure to the tiller of the soil and assuring equality of status and opportunities to all sections of the people. The principal measures for securing these objectives were consolidation of holdings, abolition of intermediary or 'rent receiving' tenures and the reform of tenancy, including regulation and reduction of rent and security of tenure. A further step to which tenancy reform led was the conferment of right of ownership on tenants.

Consolidation saves time and labour, facilitates improvement of land through irrigation as well as dry farming practices, provides an opportunity for replanning individual holdings and the village abadi and providing roads and other amenities. Appreciable progress in this direction has been made only in a few States. By the end of 1955, in Punjab over 4 million acres of land had been consolidated, in Madhya Pradesh 2.5 acres and in PEPSU over a million acres. In Bombay and Delhi 1060 and 210 villages respectively had been consolidated. In Uttar Pradesh also consolidation has been done in about 21 districts.

Inter-medary tenures like Zamindars, Jagirs and Imams prevailed over one-half of the century. Legislation for abolition of intermediaries has been enacted and has been implemented in most cases. Legislation for regulation of rents has been adopted or promoted in all States. The usual principle has been to keep one-fourth of the gross produce or less as fair rent. Also legislation providing for security tenure has been adopted in most of the States. Besides these, there has also been legislation either enacted or promoted in all States providing for ceilings on future acquisition. In spite of such moves or enactments, vested interests which always conflict with progressive measures have reduced the effectiveness of these measures. Inter-mediarries still continue under some garb or other. Rents still prevail

much more than the prescribed ones. Consolidation programmes are hampered under legal claims. Ceilings enactments torpedoed under creation of fake rights. These are problems which can be tackled only with a reasonably high cultural level and the community development programmes are intended to create the requisite climate.

Co-operation :

Co-operative activity, in fact, is not new to India. For a long time, we had co-operative societies in the country but they were merely credit giving organisations. Due to various inhibitions these societies did not make any headway. In independent India the effort has been mainly directed towards giving the co-operative movement a new life. Our Socialist Pattern of Society implies the creation of large numbers of decentralised units both in agriculture and in industry. This gives ample scope for co-operative activity in the country's economic development.

Where it succeeds, co-operation brings large gains to the community. The Rural Credit Survey conducted by the Reserve Bank of India has given ample thought to this subject. They have recommended a comprehensive form of co-operative system which would cover all sides of agriculture, namely, credit and other requirements, production, marketing and even storage. The main theme of their recommendation was to link the credit requirement of the farmer with his marketing.

Significant progress has been made in the field of co-operation, particularly with regard to credit societies. The total amount of credit advanced by co-operatives increased from Rs. 23 crores in 1950-51 to Rs. 49 crores in 1958-59. It is expected that by 1960-61 the level of about Rs. 190 crores may be reached. During the period 1950-51 to 1958-59, the number of primary agricultural societies has increased from 105,000 to 183,000 and their membership has gone up from 4.4 million to about 12 million. By the end of Second Plan it is estimated that there will be about 200,000 primary agricultural societies with a total membership of about 17 million serving about 38 per cent of the agricultural population and about 25 per cent of the total rural population. As for co-operative *marketing societies*, it is anticipated that by the end of the Second Plan nearly 1,900 co-operative marketing societies will have been established. The volume

of business handled by them, however, remains very small. These marketing have not touched the lives of the villagers mainly because of the large non-monetised sector that still exists in our rural areas. Another field in which some form of co-operative activity has taken place is in the case of processing. This has been mainly localised to sugar industry. Upto 1958 as many as 38 co-operative sugar factories were licensed. It is also anticipated to spread to such occupations as rice pounding, cotton ginning, jute baling, oil crushing, fruit canning, milk processing etc. Progress in the field of co-operative farming has not been very encouraging. This is because where integration of units are involved a certain emotional unity among the co-operators is essential. Comparatively good progress in this direction has been made in Bombay State. In 1957 there were in India 404 such societies with membership of about 13,814. These societies together covered an area of about 1 lakh acres.

The changes that came about in the key variables and other related factors like credit, marketing, attitude etc. through co-operatives and community development programmes were all responsible for the rapid rate of changes that have taken place on the production front in Indian agriculture during the past decade and more. The following table gives an idea of the changes in production that have taken place in Indian agriculture since 1948-49. Since we are not interested here in the actual figures but merely trends, the index numbers of agricultural production are given. For those interested we give in Appendix the volume of production of some of the principal crops during the years 1949-50 to 1959-60.

TABLE XVII

Year	Index of agricultural production		
	Food crops	Cash crops	All crops
1949-50	100·0	100·0	100·0
1950-51	90·5	105·9	95·6
1951-52	91·1	110·5	97·5
1952-53	101·1	103·8	102·0
1953-54	119·1	104·7	114·3
1954-55	115·0	120·9	107·0
1955-56	115·3	120·0	116·9
1956-57	120·5	130·4	123·8
1957-58	107·3	125·7	113·4

In order to find out the average annual rate of change in agricultural production a straight line was statistically fitted to the various index numbers. It was found that between the period 1948-49 to 1957-58 the output of all agricultural crops increased on an average at the rate of 3·2% per annum. Of this, foodgrains alone increased by 3·7% while cash crops increased at the rate of 17%. Such a high rate of change per annum within a short period of about 10 years is indeed revolutionary in the field of agriculture when we compare it with the very slow rate of change, we have observed during the first 40 years of this decade. Since most of our development projects like the Bhakra Nangal, the D.V.C., the Hirakud Dam, the Chambal Valley Project etc. have either been completed or started yielding fruits partially we could with optimism expect even a larger rate of growth during the ensuing period. A clear analysis of the type we have done in this book shows that there is no need for alarm or gloom on the agricultural front.

The shortages that we experienced during the past few years have been mainly due to two factors. Firstly, there is what could be called population boom that has come about in the country.

In recent years this has been the experience of all the under-developed countries. The boom has mainly come as a result of the sudden fall in death rates with no appreciable change in the birth rates. Through the activities of the World Health Organisation and because of recent innovations in medical sciences, the standard of health in the country has improved resulting in this sudden fall in death rate. This trend is likely to continue and the check has to be done the other way round through a positive approach to the problem of birth control. Even if ample birth control measures are taken the present boom is likely to continue for sometime before they become effective in checking the phenomenally growing population. It is this rapidly growing population that is mainly responsible for under-rating our significantly large attainments on the agricultural front. Another factor that has been responsible for belittling our attainments has been the large increase in demand for agricultural commodities arising from the increases in income. Investment under the Plan has increased the total money income substantially. The income elasticity of demand for food articles is very high in our country. The estimate is that it can be anywhere between 0.5 and 0.8. This is indicative of the nature of changes that come about with changes in income. As long as the growth of population and the income elasticity for agricultural goods continue to be what they are, the stresses and strains that are there in the economy are likely to continue in some form or other. No doubt, Indian agriculture has taken up to the challenge and the determination with which we are attacking the problem is sure to bring about changes of a more dynamic order.

APPENDIX TABLE

Volume of Output in Respect of Various Crop-groups from 1947-48 to 1957-58*

Years	Cereals	Pulses	Total food-grains	Oil-seeds	Fibre	Plantation	Miscellaneous	Total cash crops	All commodities
1947-48	43,741	8,253	51,994	5,117	678	281	7,700	13,776	65,770
1948-49	43,314	8,440	51,754	4,502	781	289	6,773	12,345	64,099
1949-50	46,018	8,032	54,050	5,142	1,47	297	7,055	12,542	67,592
1950-51	41,744	8,278	50,022	5,076	1,110	309	7,887	14,382	64,404
1951-52	42,888	8,287	51,175	4,949	1,400	325	8,337	15,010	66,185
1952-53	49,222	9,044	58,266	4,659	1,382	339	7,540	13,919	72,185
1953-54	58,268	10,450	68,718	5,285	1,242	307	6,905	13,739	82,457
1954-55	55,328	10,474	65,802	5,877	1,318	328	7,870	15,393	81,195
1955-56	54,456	10,831	65,287	5,705	1,451	350	8,459	15,695	81,252
1956-57	57,243	11,503	68,746	6,176	1,597	363	9,076	17,212	85,960
1957-58	52,810	9,216	62,026	5,907	1,564	357	9,042	16,880	78,906

*Estimates of Area and Production of Principal Crops in India; Ministry of Food & Agriculture, Government of India.

Note : The output of Cotton is given in terms of bundles of 392 lbs. each and that of Jute in terms of 400 lbs. each in the 'Estimates of Area and Production of Principal Crops in India' by the Ministry of Food and Agriculture. For the sake of uniformity in handling the data we have converted them into tons in our tables.